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SUMMARY

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THE ROLE OF HEAVY CHEMICALS IN INDUSTRIAL DEVELOPMENT

By F.G. LAMONT, M.Sc.

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AGENDA ITEM D 12.1

THE ROLE OF HEAVY CHEMICALS IN INDUSTRIAL DEVELOPMENT

F. G. LAMONT M.Sc.

SUMMARY

It is widely assumed that the establishment locally of the heavy chemical industry is fundamental to progress from the earliest stages in all the less developed areas. This is not necessarily so (vide Canada, Australia) but in general it will play a large part, though the pattern and impact must depend in major degree on the peculiar circumstances of the area in question. In general development of these areas implies massive capital investment and since the availability of capital, whether from internal savings (private or public) or outside aid is inevitably limited, development must be keenly selective particularly in the early stages. In this the chemical industry must compete with other industries. In such circumstances a considerable degree of planning both central and individual must be envisaged and a sound criterion adopted for the allocation of priorities. Apart from emergency or very special situations the classical assessment of return on total capital involved is still the best yardstick for securing the maximum contribution to progress in the shortest time though unfortunately this criterion will, in many cases, be influenced by the usual necessity to conserve foreign exchange.

Obviously any planning whether on large or small scale must start with an assessment of the area's growing needs against the evolving pattern of its general development. These must be considered against the area's available resources in raw materials, facilities etc., with due regard to geographical distribution.

The major sectors of the heavy chemical industry are discussed against this background. The fermentation industry may have missed an opportunity of developing a field of simpler organic chemicals now being dominated by petrochemicals. Fertilisers may be of early interest. Production of nitrogen products via ammonia are more easily justified than phosphatics. Both lead into the acid industry with which explosives are related but represent a specialised technology.

Chlorine for hygenic purposes can be produced on a small scale but for plastics and general chemistry large units based on low cost salt and power are required. The concurrently produced caustic is usually welcome whereas alkali manufacture via the ammonia-soda process is difficult to justify.

Many organic processes can be operated economically on small scale but this field is increasingly dominated by petrochemicals utilising high cost specialised plants economic on large scale. Plastics generally also involve elaborate high cost plants as does the production of polymers for synthetic fibres though small scale spinning units may be viable based on purchased polymer or advanced intermediates.

The dyestuffs field more than any other uses multi-purpose units though processes for primaries and early intermediates are becoming more specialised. Development in this field should be gradually "backward" from finished dye to primary chemical.

The greatest obstacle to development of the heavy chemical industry in less developed areas is probably its increasing sophistication in the developed countries leading to increasing unit sizes and higher capital cost per ton year. Timing is therefore of the utmost importance so that the economy is not saddled with units of uneconomic size and fragmentation of the industry will largely nullify its benefits. The marginal gain per annum in the struggle to the so-called "self generating stage" is generally small and political expediency or dogma should not be allowed to vitiate should technical and economic planning.

At the same time it should not be assumed that minimum economic sizes established elsewhere are necessarily valid in a new area not indeed that accepted routes or technology are sacrosanct. Indeed the greatest technical effort is required in adopting and simplifying established techniques particularly in scaling down unit sizes to suit local conditions, reduce capital investment and secure maximum return.

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